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USSR Report

ENERGY

No. 66



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ELECTRIC POWER

COORDINATED POWER-STATION OPERATION TO SOLVE PEAK-DEMAND PROBLEMS

Leningrad LENINGRADSKAYA PRAVDA in Russian 10 Mar 81 p 1

[Article by department chief of the USSR Ministry of Power Engineering and Electrification V. Timchenko: "The South-Ukrainian Power Complex"]

[Text] The daily load on power systems in our country is uneven: the peak hours come in the evening, while the consumption of electric power is considerably reduced at night. The nighttime load, for example, in the country's central region, the northwest and the south of the USSR's European territory comprises only 55 to 60 percent of the maximum.

The operation of power-generating units under sharply varying conditions causes a considerable expenditure of fuel. It has a negative effect on the condition of the equipment (increases wear and decreases service life) and degrades the economic indicators of operation. Thus, large-scale power pools must possess a sufficient number of shunting power sources.

The problem of covering the variable portion of the load schedule or, as it is still referred to, the peak problem, can be solved by constructing special electric power stations, primarily hydroaccumulating (GAES) stations which can be brought into operation rapidly.

The Basic Directions call for construction of hydroaccumulating electric power stations in the country's European sector. One of them, the Konstantinovskaya, will enter the South-Ukrainian Power Complex which will join atomic, hydroelectric and hydroaccumulating power stations.

The operation of a hydroaccumulating electric station is based on the cyclical movement of the same volume of water between two basins situated at different levels. When water is run off the upper basin into the lower basin through the turbines, the GAES operates like an ordinary GES, supplying power to the power system. When water is pumped in the opposite direction, it operates as a pumping station. Working at night in the pumping mode, hydroaccumulating electric power stations consume excess power from thermal electric power stations. As a result of the operational conditions of the latter, matters are balanced and the necessity of stopping the stations no longer exists.

Thus, the GAES improves the operating conditions of both thermal and atomic power stations. They can be used in power systems as an emergency backup and for regulating the power output, particularly during periods when the load rises and falls sharply.

In contrast to a GES, a hydroaccumulating station is equipped with reversible hydraulic machinery (instead of the usual turbines) or auxiliary pumps. The electrical machinery, as a rule, is used in two operational modes: as generator and as motor.

In recent years the world has devoted great attention to the construction of power complexes, including GAES's and large-scale thermal and atomic electric-power stations. The method of electric-power production dictates the location of thermal and atomic electric power stations near large reservoirs which must, at the same time, be used for hydroelectric power purposes.

The construction of the first such complex in the USSR (the South-Ukrainian) was begun on the Bug river. It unites the South-Ukrainian AES (4 million kW), the Tashlykskaya GES (1.8 million kW) and the Konstantinovskaya GAES (0.38 million kW). Along with the Tashlykskoye and Konstantinovskoye reservoirs, the complex includes the Aleksandrovskeye reservoir which will accept water from the GES and the GAES.

According to the design, water from the AES condensers arrives at the Tashlykskoye reservoir, is cooled and then during the four hours of the evening is run off through the turbines of the Tashlykskaya GES into the Aleksandrovskeye reservoir. At the same time, the GAES is operating in the turbine mode, likewise running water off the Konstantinovskoye reservoir into the Aleksandrovskeye.

During the hours of the nighttime and daytime lows in the load schedule, water is pumped for 7 to 11 hours by means of the GAES reversing units from the Aleksandrovskeye reservoir into the Konstantinovskoye. Farther along, the pumping station of the first ascent brings the water into the Tashlykskoye reservoir to the water intake of the AES, from where the pumps of the second ascent raise it into the AES's cooling system.

The creation of a powerful electric power station complex on the South Bug will make it possible to improve the electric power supply to the consumers. The effect is appreciable during joint construction of the stations due to the more complete utilization of supply lines, vehicles, etc. For example, due to the joint location of installations on a single construction site of the South-Ukrainian complex, a savings of approximately 15 percent of the capital investment can be obtained in comparison with the individual construction of three electric stations and an irrigation system. During the complex's operations the problem of supplying water to the AES and cooling its hot water is successfully solved. The AES basin will be used as a multipurpose reservoir.

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ELECTRIC POWER

DELAYS HINDER MOGILEV TETS-2 EXPANSION

Minsk SOVETSKAYA BELORUSSIYA in Russian 7 May 81 p 2

[Article by M. Kapel'chik: "When Will the New Power-Generating Unit Provide Current?"]

[Text] The Mogilev TETS-2 is situated alongside the leading enterprise of the Khimvolokno association--a synthetic-fiber combine. Electric power, heat and hot water are supplied here to the combine.

By the end of the present year the association will have to put the DMT-4 plant into operation. It will be necessary to increase the output of the TETS-2 in order to provide electric power to the plant.

The expansion of the TETS began in 1979, but today the construction site looks as if the work had been started only yesterday.

In two years, the TETS-2 construction administration completed construction and installation work equal to only 14.2 percent of the estimated cost of the first unit to be activated. The USSR Ministry of Energy did not allot funds for the construction of access routes, roads and dormitories. Now we are forced to pay dearly for this lack of foresight.

In order to commission this power unit in the current year, it is necessary to do three times as much work as for 1980, while only 68 percent of the plan for the first quarter has been completed.

The USSR Ministry of Power Engineering and Electrification has done much to supply the construction site. The construction administration's site for the industrial production base is literally heaped over with metal and reinforced-concrete structural elements, slabs, panels and pipes. Equipment for the power-generating unit is being delivered in advance of construction readiness. The pace of construction, unfortunately, is lagging behind schedule.

The client and the chief general contractor complain about the unsatisfactory work of the Belenergostroy Mekhanizatsiya section. The construction site is lacking two five-and-ten-ton cranes, one 25-ton crane and two tower cranes. Out of the five excavators on hand only two are operational and half of the four bulldozers are not being used. There is a critical shortage of hoists. There is a lack of motor transport.

An item of primary importance is the main TETs building. The collective of the Belenergomontazh section is working here with great effort. Almost all of the work teams, as in other sectors, are working on a job contract plus bonus basis. The collective of experienced brigade leader Vladimir Poddyachiy sets the tone in socialist competition. The work teams have displayed great skill in the installation of the upper-level portion of the main building under complex conditions. The work team of riggers under Peter Semashko is compared to this collective.

During the period when there were no roads, the section did not operate at full strength. They lost three weeks because it was not possible to move a heavy-duty crane a few dozen meters. The assembly of the tower crane was delayed for the same reason. It goes without saying that all this delays the erection of the main building.

The builders' woes do not end here. The chief of Tsentrenergostroyontazh erection site, Sergey Ivanovich Alekseyenko, looks upon the snail's pace of construction with alarm and worry.

"The present delays are a heavy burden on us," he says. According to production engineering, it takes six months to install a boiler, four months for a turbine. More than 1,600 tons of industrial pipeline must be laid. One and a half million rubles of work must be carried out, but only 75,000 rubles worth has been done in the first quarter. The section collective must prepare the foundation under the turbine and the boiler. Now it is necessary to lay more than 1,500 m³ of cast-in-situ reinforced concrete. These operations are being delayed because the industrial production procurement administration of the Belenergostroy trust did not deliver the hardware. As yet unresolved is the problem of deliveries of prefabricated reinforced-concrete structural members for the industrial pipeline scaffolds. There are no fittings for the cooling-tower basin, even though, according to the method used, eight months are required for its connection. A great amount of work remains to be done by the electricians and insulators.

There are many other questions requiring immediate resolution. The construction and installation teams have not been supplied with the standard tool sets. There is a critical need for small-scale mechanization on the construction site.

Each day more and more new qualified workers arrive at the site. About 1,500 people should be working here during the summer. Already, however, the site management is racking its brains trying to figure out where to put them. Indeed, the incorporation of the dormitory, like the construction facilities, is planned for the fourth quarter.

The Mogilev gorkom of the Communist Party of Belorussia and the gorispolkom are now compelled to take extraordinary measures in order to render assistance to the builders. In particular, they are repairing dormitory number six, which the Khimvolokna association has temporarily put at the disposal of the power engineers. But, as strange as it may seem, they have not speeded up the construction of the TETs-2 dormitory. The laying of the engineering nets has not been completed at the construction site. There are no floor slabs for the fifth floor. Plans have been made to deliver them from the Svetlogorskiy and Svetlovodskiy (Kirovogradskaya Oblast) reinforced-concrete plants, but not until the third quarter.

The situation is also growing more complicated because it is necessary to re-do a number of power circuits at operational sections. This must be done without interrupting the delivery of power to the combine for even an hour.

The NIPPIenergoprom [further expansion not provided] is delaying the documentation on the reinforcement of a number of structural elements. Now at the construction site there are daily misunderstandings and difficulties arising because of errors in the design documentation. There are no designers at the construction site who would be able without delay to solve the problems that arise.

The most favorable time for construction has arrived. We must now utilize each day, each hour, to increase the tempo of the work and eliminate delays. It is not possible to achieve this without the highest degree of organization and the complete mutual understanding of all who are responsible for the construction of the new machinery at the Mogilev TETs-2. Only through their joint efforts can the situation be rectified and the timely commissioning of the new generating unit be insured.

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ELECTRIC POWER

MINERCO CRITICIZED FOR 'S MANAGEMENT OF MOLDAVIAN GRES CONSTRUCTION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 8 May 81 p 1

[Article by A. Pasechnik: "The Abbreviated Version"]

[Text] In October 1979 our newspaper published its first material in the column "The SOTSIALISTICHESKAYA INDUSTRIYA Mailbox." At a meeting of Moldavian GRES power engineers with main administration officials and party and Soviet workers, many pointed questions were posed regarding the work, living conditions and recreation of workers and specialists at the station. Methods for solving these problems were proposed.

A year later the newspaper checked to see how the suggestions and observations expressed by the power engineers were being carried out. A letter entitled "No Mere Words" published on 9 December of last year discussed the great amount of work carried out by the station services, Moldglavenergo and by local party and Soviet organs. Moreover, noted the newspaper, not everything that had been intended had been done nor had all measures drawn up with regard to the suggestions and observations of the station workers been accomplished.

In particular, blame was directed toward those officials of the USSR Ministry of Power Engineering and Electrification Glavenergokomplekt who had not managed to achieve the timely delivery of equipment for expanding the station. For this reason, the letter said, the station's 11th and 12th generating units had been put into operation in an "abbreviated" version without the 40-MW gas turbines. Indeed, this is not only insufficient power--it is an uneconomical operational mode for the steam-power units already in operation. Once again the newspaper also addressed the acute problem of pollution of the estuary with wastes from the GRES.

Here is how the first deputy minister of the USSR Ministry of Power Engineering and Electrification, Ye. Borisov, replied to the action of SOTSIALISTICHESKOYE INDUSTRIYA: "The Khar'kov Turbine Plant association did not insure the manufacture of gas turbines for the Moldavian GRES within the timeframe set by the USSR Gosplan. The plant was under obligation to manufacture the first gas turbine in 1979 but actually delivered it in April of 1980. The second gas turbine was not produced during the second quarter of 1980 but was slated for manufacture in the second quarter of 1981. Gas turbine No. 1 was put into operation in December of last year. The commissioning of the second turbine is planned for the third quarter of 1981. The Ministry of Power Engineering and Electrification reports the following concern-

ing the progress being made on implementing measures to prevent pollution of the Kuchurgan estuary by industrial wastes from the Moldavian GRES. The plan calls for the construction of a complex of purification buildings with a capacity of 8,100 m³ per hour. Construction of the last building in this complex was completed in September 1980--an installation for the biochemical purification of sewage water from the settlement of Dnestrovsk and the GRES itself. Thus, at the present time, the rated capacity of the purification facilities has been achieved."

What follows from this answer? The failure to commission the turbines is on the conscience of the Khar'kov workers who have not produced the units within the specified time. With regard to the pollution of the estuary, there is nothing to become alarmed over--the purification facilities have been built and even brought up to the design capacity. Does this mean that the criticism was misdirected?

Let us examine the situation. Indeed, the Khar'kov workers were obligated to the Moldavian power engineers. Whether it is their fault or whether harm has been done is the subject of a separate discussion. The question here is about something else--the responsibility and efficiency of the USSR Minenergo's services, particularly of Glavenergokomplekt. The facts are these.

At the beginning, the main administration steered the GRES contract toward the installation of the turbine in the third quarter of 1980. In February 1980, however, the GRES received a letter signed by V. Kondratenko, chief of Glavenergoprojekt, saying that the unit would not be ready until 1981. They became concerned at the station: What quarter exactly should they make plans for? A year, as they say, is a loose concept. Lively correspondence with the USSR Minenergo, however, cleared up nothing. Finally, at the beginning of 1981, it was established once and for all: the second quarter.

This, however, is still not all.

As it subsequently turned out, the manufacture of the turbine in Khar'kov was not slated for the second quarter of the current year, as Ye. Borisov had written, but for the first quarter of 1982. Something else turned up, too. Up until now, vital orders have not been placed for the manufacture of 74 tons of pipeline, without which the turbine is just a lump of metal.

A perfectly legitimate question arises: In light of these questions, how, then, can one evaluate the work of Glavenergokomplekt with its suppliers? Who must soberly weigh their potentials and, in accordance with this, carry out the construction? We are now faced with the acute problem of struggling with an imbalance in the national economic plans. Projecting this problem onto this specific case, one cannot help but notice that this problem concerns not only those people who make the equipment, raw materials, etc., but also those who utilize them. The lack of order and responsibility and the absence of real estimates costs too much. It is not surprising that in the face of such confusion about the equipment, the construction work at the GRES is now practically curtailed. Meanwhile, as strange as it may seem, no one has pushed back the timetable for commissioning the turbine.

Now, about the second question. The deputy minister was entirely correct when he wrote that construction of the complex of purification buildings was completed.

This fact, however, has nothing to do with preventing the pollution of the estuary with industrial wastes from the GRES, for this complex is intended for the purification of sewage waters from the settlement and the station. Meanwhile, Glavgosvodinspektsiya of Moldavia has long ago written the power engineers the most stringent regulations regarding the necessity of arranging a purification system for oily wastes from the production site. There is a design for such a complex at the station, but no money--about 400,000 rubles. For two years, the USSR Minenergo has been trying to resolve the issue of the apportionment of these funds. It still is unclear whether they will be apportioned or not.

No mere words. It is not by accident that this is what we called our correspondence with the Moldavian GRES. Behind this letter, we repeat, stood specific issues calling for help to be given to the power engineers in their work, the organization of labor and their daily lives. Unfortunately, you cannot say this about the last reply received from the USSR Minenergo by our editorial staff.

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ELECTRIC POWER

DEVELOPMENT OF EKIBASTUZ RESOURCES CONTINUES

Leningrad LENINGRADSKAYA PRAVDA in Russian 22 Mar 81 p 1

[Article by first secretary of the Pavlodar obkom of the Kazakhstan Communist Party S. Isayev: "The Present and Future of Ekibastuz"]

[Text] What served as the basis for the creation of a powerful industrial center in this region of Kazakhstan which even until recently was remote and god-forsaken? To answer such a question means discussing the unique Pavlodar-Ekibastuz territorial production complex, the organization of which depended upon the fortuitous combination of large-scale fuel, power, mineral, raw material and water resources as well as upon the advantageous geographical and transportation situation of the region. From south to north this region is intersected by the high-water Irtysh river and from west to east by the Trans-Siberian railroad.

The complex possesses an elaborate multi-industry structure. The coal, oil-refining, and power-production industries as well as the energy-intensive machine-construction industry are being developed here. The main basis of the complex is the enormous deposits of energy-producing coal in the Ekibastuz and Naykubenskoye formations which comprise about 14 billion tons according to the geologists' estimations. In the near future the country will receive 170 million tons of coal annually from these subterranean warehouses. These coal-deposit reserves are concentrated here over a small area and lie close to the surface. This makes it possible to mine the fuel using the most economical method--strip-mining.

All this has created a good prerequisite for the industrial development of the region. Today one has every reason to call the Pavlodar Priirtysh'ye the center of developed machine construction, metallurgy and petroleum chemistry. There is an aluminum plant operating on the basis of local and nearby mineral deposits. The Boshchekul'skiy mining and enrichment plant is being built to mine copper. The output of products from the Vernak ferroalloy plant is being expanded. The Pavlodar tractor builders are preparing to master the production of powerful R-701 machines. We recently commissioned the first phase of a modern petroleum-processing plant.

Construction has been completed on the Bogatyr', the world's largest open pit mine. Since the moment the first phase was put into operation (10 years ago), 205 million tons of fuel have been delivered to consumers. In 1980, the Ekibastuzugol' association mined about 70 million tons of coal.

Development of the Maykubanskoye deposit will begin soon. It will provide the country with 20 million tons of fuel annually.

The cost of the coal from the Priirtyah'ye is the lowest in the country. At the present time, about 20 large-scale electric power stations in Kazakhstan, Central Asia, Siberia and the Urals are operating on this fuel. The low cost of the Ekibastuz coal, however, is nullified by transportation expenses. If one takes into consideration the high ash content of the fuel, then sending it over long distances is not very profitable. This is why the CPSU Central Committee and the USSR Council of Ministers adopted a resolution "On the Creation of the Ekibastuz Fuel-and-Power Complex and the Construction of the 1,500-kV Direct-Current Ekibastuz-Center Electric Transmission Line." Five electric power stations, each with an output of 4 million kW will be built in the Ekibastuz region and on the shores of Lake Balkhash. They will take a considerable portion of the coal mined into their furnaces.

The Ekibastuz coal contains a considerable amount of valuable mineral substances. How do they propose to utilize the coal by-products? When all the Priirtyah'ye GRES's are put into operation, 140 tons of ash will have to be hauled away every 24 hours. A considerable portion of the ash is aluminum oxide, a feasible raw material for the now-operational Pavlodar aluminum plant. There are many rare metals in the ash, also. Moreover, the ash can be successfully utilized in the production of construction materials.

With the completion of construction on the planned power-station cascade, the Kazakh SSR will begin to deliver electric power to the other republics. At the present time a super-long 2,415-km Ekibastuz-Center electric transmission line is being built. Up to 40 billion kWh of electric power will be transmitted along this line annually to the USSR's European sector.

In addition, a super-high voltage power bridge (1,150 kV of alternating current) will be laid from Ekibastuz-Kokchetav-Kustanay-Chelyabinsk. Electric lines will be constructed from Ekibastuz-Barnaul-Kuzbass-Itak (Krasnoyarskiy Krai). Every year 80 billion kWh of electric power will be transmitted in these directions.

The formation of the Pavlodar-Ekibastuz territorial production complex in northeast Kazakhstan is one of the important links in the business of developing our country's eastern regions.

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ENERGY CONSERVATION

CORRUPTION WIDESPREAD IN FILLING STATIONS, OFFICIALS LAX

Tbilisi KOMUNISTI in Georgian 10 Mar 81 p 4

[Article by V. Gabellia: "Let's Use Fuel According to Plan. What's Happening at the Filling Stations"]

[Text] The role of automotive transport in the economy is growing steadily along with scientific technical progress.

At the 26th Georgian CP Congress it was stated:

"During the 11th Five-year Plan automotive freight haulage and passenger transport will grow at a rapid pace, and the sphere and volume of maritime and air transport will expand.

"Automotive freight haulage will increase by 43 percent, passenger transport by almost one third. Vehicle, engine, and component repair plants, garages, and container yards will be built."

We can see, then, that ambitious plans have been mapped out for the future and, of course, close attention must be paid to carrying out and implementing them.

In order for automotive transport to operate efficiently, not only automotive transport enterprises and private and state-owned vehicles but also highways and, of course, filling stations must be kept in good working order.

Our purpose now is to discuss the work of the republic's filling stations and petroleum products depots. There has been much discussion of these matters, and progress has been made, but not everything is in good shape by any means. Unfortunately, we still encounter substantial violations.

It would be wrong to say that the control organs of the GSSR Council of Ministers Glavneftesnabzbyt [Main Administration for the Supply and Marketing of Petroleum Products] and the GSSR Trade Ministry's Main Administration of the State Inspectorate of Commodities Quality and Trade have failed to pay attention to these matters--in fact, they have conducted checkups and raids and made specific measures. But this has not been enough, and infractions have continued.

But what violations in the supply and marketing of fuels and lubricants are we referring to? We are referring to deliberate downgrading of gasoline quality, falsification of coupon transactions, and unauthorized cash sales of gasoline. Frequently we have documented proof of the infractions, yet for some reason no local administrative measures are taken, the guilty parties continue their wrongdoing, and this continues as long as they can get away with it.

In December of last year and the end of January this year, the Main Administration of the State Inspectorate of Commodities Quality and Trade investigated the work of three filling stations of the Kutaisi Petroleum Products Depot, two stations of the Tbilisi Depot, and one station belonging to the Mtskheta Depot. Their findings, frankly, were deplorable. Substantial violations of various kinds were uncovered in all six stations. These and other facts indicate that there is widespread criminality in the marketing of fuels and lubricants.

In checking up on Filling Station No 1 of the Kutaisi Petroleum Products Depot (temporary acting chief operator O. Bokhvadze) investigators found 448 rubles of unauthorized cash transactions and 25 coupons for 1130 liters of A-76 gasoline, 45 coupons for 1820 liters of diesel fuel, and seven coupons for 17 liters of motor oil unaccounted for. A checkup of the shift books revealed a surplus of coupons for 33 liters of AS-8 motor oil and a shortage of 30 liters of A-72 and AI-93 gasoline. Some 630 liters of Zhiguli oil were sold without coupons.

Similar infractions were found in Takaltubo Filling Station No 9 of the same petroleum products depot (chief operator A. Tvaladze). In operator L. Sebiashvili's desk drawer they found unaccounted coupons for 1690 liters of AI-93 gasoline; two 10-liter and four 20-liter coupons did not have the organization stamp showing the quarter. A check of the shift books revealed a shortage of 341 liters of various brands of gasoline and sales of 250 liters of AI-93 gasoline without coupons. The same kinds of infractions were exposed in Filling Station No 2 (chief operator K. Shanshiashvili).

In Tbilisi's Filling Station No 7, run by chief operator N. Takhvediani, the state seal had been ripped off the front of the counting mechanism of the No 4 A-76 gasoline pump. The operator was discovered to have in his possession unaccounted coupons for 440 liters of AI-93 gasoline. The investigation also found other infractions. The operators had not been checking the state seals or the pump delivery accuracy when changing shifts. According to Glavneftesnabbyt, eighteen facilities were checked up on recently, including the Marneuli and Sukhumi petroleum products depots and a number of filling stations.

In investigating Sukhumi's Filling Station No 1, it was found that the octane rating of the AI-93 gasoline had been lowered. Similar infractions were found in filling stations No 4 and No 2 and in the Sukhumi Petroleum Products Depot itself. It was also found that substandard A-72 gasoline had been brought in by rail tank car.

These are just a few of the violations that have been uncovered in the republic's petroleum products depots and filling stations. To all appearances, everything is according to schedule--checkups, raids, and punishments for wrongdoing. Yet, the violations continue.

The question is, why?

It appears to be due chiefly to the fact that we are not following through. Local officials often do a perfunctory job, covering up for the guilty parties and not paying enough attention to cadre selection and cadre work.

Along with others, of course, Glavnefteasababyt is at fault here. Looking over the work it has done (referring to checkups, raids, documentary evidence, and orders issued on that basis), we might conclude that everything is going well. But are all these orders issued by the administration being unconditionally carried out locally? Of course not. Therefore, more exactingness and higher principles are essential. When checking up on the work of the petroleum products depots and filling stations it is essential also to check up on how well earlier decisions and orders are being carried out.

The actual business at hand is what is important...results and not just paper shuffling. When we punish a criminal and bring him to justice, we ought to replace him with someone who can do a proper job in a honest and disciplined manner and not go astray.

Today, energy and fuel constitute one of our most important problems. Therefore, we must be vitally concerned for keeping track of every liter of fuel, conserving it and using it wisely. Apparently the efforts of the control organs responsible for this matter are not enough. It requires the help, support, and of course the control of local party and soviet organs.

The republic's petroleum products depots and filling stations must be brought fully into line everywhere.

GRIL

CSO: 1813/050

FUELS

GOSPLAN CHAIRMAN BAYBAKOV INTERVIEWED ON DEVELOPMENT OF GAS INDUSTRY

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 3, Mar 81 pp 2-4

[Interview with Nikolay Konstantinovich Baybakov, chairman of USSR Gosplan; date and place not specified]

[Text] The 26th CPSU Congress ratified a grandiose program of socioeconomic transformations in the country in the 11th Five-Year Plan and subsequent years. The gas industry, a key fuel and raw material sector, has an important part in realization of this program.

The editors called on Nikolay Konstantinovich Baybakov, a delegate to the 26th CPSU Congress and Chairman of USSR Gosplan, to answer a number of questions. We publish the interview below.

[Question] In the last 20 years the production of gas resources in the country has increased almost 10 times. The share of gas in total production of fuel-energy resources rose from 7.5 percent in 1960 to 26 percent in 1980. The domestic gas industry developed especially fast in the 10th Five-Year Plan. Last year more than 435 billion cubic meters of gas was extracted, and the average annual growth in extraction of gas during 1976-1980 was 29 billion cubic meters.

In your opinion, Nikolay Konstantinovich, what are the crucial factors in the gas industry's achievement of such high developmental goals?

[Answer] Throughout the history of development of the gas industry the Communist Party of the Soviet Union and the Soviet Government have given enormous attention to accelerating the growth rate of natural gas extraction as a key condition to insuring technical progress, growth in public production, and improvement and consolidation of the country's fuel-energy complex.

In the last 15 years the party has worked out a number of fundamental policies and organized fulfillment of major programs and plans for the development of the gas industry and gas supply to the national economy.

These fundamental policies and major programs, which have been reflected in important party documents and the decisions of party congresses and Plenums of the CPSU Central Committee, are the following:

- advance preparation of large volumes of new gas reserves in order to fully meet the growing needs of our developing national economy;
- supplying the gas industry with progressive, highly efficient new equipment;
- orientation to high levels of concentration of gas extraction and transportation and constantly raising the unit capacity of the equipment;
- forming large territorial gas-industry complexes and regions;
- insuring deeper refining of natural gas and creating gas-chemical complexes on this basis;
- centralizing gas distribution and shaping the Uniform State Gas Supply System with an eye to increasing the working reliability of the entire gas system;
- constantly improving the structure of management of the gas sector to raise its efficiency;
- increasing the export of Soviet gas to the countries of the socialist community and its growing importance in development of the processes of socialist economic integration.

Persistent work to carry out these programs made possible a significant expansion of the raw material base of the sector and formation of major new gas extraction regions in Tyumenskaya Oblast, the Turkmen SSR, and Orenburgskaya Oblast. This is where we particularly saw the impact of the factors of concentration and centralization of gas extraction and refining on the basis of consistent implementation of technical policy aimed at increasing the unit capacities of the wells and industrial equipment to insure accelerated launching of deposits and gas refineries. In 1980 almost 40 percent of all gas extracted in the country came from six-inch and eight-inch wells. Half of the gas extracted today is prepared for transportation at full preparation installations which have a capacity of 3-5 million cubic meters a day for one industrial line. The building of these industrial lines made it possible to build comprehensive gas preparation installations with capacities of 10-15 billion cubic meters a year while significantly cutting construction time.

The transition to building mostly large multipipe gas pipeline systems using pipe with diameters of 1,220 millimeters and 1,420 millimeters played a determining

part in accelerating the growth rate of the sector. Such pipe makes up 30 percent of the total length of pipelines. Broad use of the GPA-Ts-6.3 gas pumping aggregates with aviation drive made it possible to reduce the construction time of compressor plants by 2.5-3 times and cut labor inputs by 60 percent. Introduction of modular cellarless GPA-10 gas pumping aggregates with ship drive, GTN-6 aggregates with turbine drives, and STD-12500 aggregates with electrical drive has begun.

All of these progressive changes have accelerated the development of the USSR's circular Unified Gas Supply System, the largest in the world. It is technologically connected to all sectors of industry. By the end of 1980 the length of trunk gas pipelines reached 130,000 kilometers and the aggregate power of compressor plants was 18 million kilowatts. The length of the gas distribution network exceeded 129,000 kilometers.

[Question] The document "Basic Directions of Economic and Social Development of the USSR for 1981-1985 and the Period of 1990" defined the special role of natural gas in solving the fuel-energy problem and accelerating the development of the chemical and other sectors of industry and posed the task of carrying out a large-scale program of accelerated development of the petroleum-gas industry of Western Siberia. This document envisions that extraction of natural gas in 1985 will rise to 600-640 billion cubic meters. Reaching this goal will require new engineering concepts.

Nikolay Konstantinovich, we know that you devote a great deal of attention to questions of scientific-technical progress. In your opinion, what are the main tasks of further technical re-equipping of the gas industry, particularly with respect to gas transportation?

[Answer] The paramount challenge is to accelerate work now underway to build a set of technical means for gradually switching to the construction of a new class of gas pipeline systems. I am referring to gas pipelines with a diameter of 1,420 millimeters working at pressures of 100-120 atmospheres. Compared to gas pipelines working on a pressure of 75 atmospheres, where other conditions are equal, they will increase productivity by 33 percent with a significant reduction in labor inputs.

The most important job in accelerating the construction of trunk pipelines and increasing the reliability of their operation is accelerating the development and introduction of the most efficient gas pumping aggregates, such as the GTN-16 and GTN-25, in the cellarless model with full-pressure superchargers, and aggregates such as the GPA-10 with ship drive and the GPA-Ts-16 with aviation drive and full-pressure superchargers. The high economic efficiency of these technical units is illustrated by the following figures: the adoption of more powerful aggregates on a gas pipeline with a diameter of 1,420 millimeters reduces the required number of aggregates by one-half; the use of two-stage full-pressure superchargers reduces the volume of installation work and need for taps, connecting parts, and cable by 40-50 percent; labor expenditures to build compressor plants using aggregates with ship engines are cut by two-thirds compared to the use of the GTK-10 aggregate; the introduction of aggregates with power outputs of 16,000

and 25,000 kilowatts with full-pressure superchargers makes it possible to reduce the construction volume of compressor shelters by more than two-thirds, cut the metal-intensiveness of the design by one-half to two-thirds, and lower the labor-intensiveness of construction by one-third to one-half.

[Question] Comprehensive use of natural gas has become a typical feature of the recent years of gas industry development. In the 10th Five-Year Plan the volume of gas refining doubled, reaching 64 billion cubic meters in 1980.

What role will further development of the gas-chemical sector play for the national economy?

[Answer] The natural gas of many deposits contains numerous valuable components in addition to methane, for example, ethane, propane, butane, sulfur, and helium. Therefore, it should be viewed as a valuable raw material for many economic sectors.

The important structural changes in gas refining in the period 1981-1990, which began in conformity with the decisions of the 24th and 25th CPSU Congresses, should be carried out even more rapidly and on a larger scale. With completion of construction of the Orenburg gas refinery and the first stage of expansion of the Murabek refinery the gas industry entered the 11th Five-Year Plan with a fully developed gas chemical sector. On this basis further development should take the line of furthering comprehensive refining, both expanding the assortment of gas refining products at existing enterprises and building new capacities.

Increasing the volume and depth of natural gas refining will make it possible to extract from it ethane for production of polyethylene and liquefied gases for domestic use and use in motor vehicle transportation. The extraction and refining of hydrogen-containing gases, especially from Astrakhan', will make it possible to establish a reliable long-term raw material base for the production of mineral fertilizers and many types of valuable chemicals.

Increasing the volume of helium production will accelerate technical progress in key areas of science and technology: development and practical introduction of superconductive power transmission lines and fast-neutron atomic reactors; obtaining pure metals; producing cryogenic equipment; developing the continental shelf of the seas and oceans, and so on.

The role of the gas industry in supplying raw material and rare gases to other sectors of the economy will increase steadily.

It is also essential to devote considerable attention to increasing the extraction and production of stable gas condensate, especially from Western Siberia. It will play an important part in providing light petroleum products, gasoline, and diesel and motor fuel to the economy.

[Question] Nikolay Konstantinovich, you mention the possibility of broader use of liquefied gas for motor vehicle transportation. Its use as a motor vehicle fuel promotes a healthy environment for many cities of the country.

The experience of the L'vov motor vehicle workers, who use compressed natural gas instead of gasoline, has also recommended itself.

What are the prospects for using such a substitute in motor vehicle transportation.

[Answer] Operating motor vehicle transportation on compressed natural gas is a new way to use the high-calorie gas fuel that is broadly available for energy needs.

Its advantages over traditional fuel, gasoline, have been demonstrated in practice. It increases the service life of the engine and motor oils. Harmful emissions to the atmosphere are significantly reduced. The higher octane number of natural gas makes it possible to obtain the power of a gasoline engine when the degree of engine compression is increased.

The motor vehicle builders have been assigned this year to produce the first industrial batch of trucks equipped with a dual fuel system that can use either gasoline or compressed natural gas as fuel. Such a system will make it possible to compensate at first for possible breakdowns in the supply of natural gas fuel at filling stations.

The compressed natural gas filling stations, which are connected to the trunk gas pipelines, are to be located together with modern filling stations.

Concurrently with working out the design of the system to fuel engines with natural gas, the Ministry of Ferrous Metallurgy together with the Ministry of Automotive Industry and other associated ministries must solve the problems of reducing the weight of gas tanks, which now weigh up to 600 kilograms, in order to bring the service life of trucks back to the norm.

The Ministry of Gas Industry is also given important jobs as the supplier of highly pure natural gas. The ministry is to work out the technical specifications and detail design for a model filling station with modular units making maximum use of series-produced types of equipment, mountings, and instruments.

By the end of the current five-year plan it is contemplated that the country's truck fleet will have 100,000 vehicles working on compressed natural gas.

From the Editors

The editors thank Nikolay Konstantinovich for this interesting, informative interview.

Nikolay Konstantinovich Baybakov was 70 years old on 7 March 1981. He is a major organizer of the petroleum industry, a major scientist in the field of mining, and a prominent state figure.

The long years of productive work by N. K. Baybakov are an example of worthy service to our native land and to the cause of building communism. Nikolay

Konstantinovich has come a long way from a position as a rank-and-file engineer to deputy chairman of the USSR Council of Ministers and Chairman of the USSR Gosplan. He has always worked like a communist, a follower of Lenin, applying all his efforts and knowledge with a sense of great patriotic duty. He has received many awards for his work: five Orders of Lenin, two Orders of the Labor Red Banner, and numerous medals.

In his position as Chairman of USSR Gosplan N. K. Baybakov devotes greater attention to improving current and future planning for the country's fuel-energy complex. He has a large part in deciding the key issues of development of the gas industry.

N. K. Baybakov has made an enormous contribution to building the major petroleum-gas extraction regions of the country, the Volga-Ural region and Western Siberia. He proposed the method of electrical modeling of the processes of working a group of gas (gas condensate) deposits confined to a single system of layers and summarized experience with the use of the high-pressure gas collection system with low-temperature separation. N. K. Baybakov's works in the field of thermal techniques of intensifying petroleum extraction are widely known, and he received the Lenin Prize for his comprehensive solution to the problem of drilling and exploiting gas and gas condensate deposits.

Nikolay Konstantinovich Baybakov devotes a great deal of attention to furthering work on development of the country's continental shelf. His name is linked to the origins of the city of oil workers on the Caspian which began, in the early days of development of the Neftyanyye Kavni deposit, with the manmade bay constructed of seven sunken ships.

The board of directors of the Ministry of Gas Industry and the editorial board of the journal GAZOVAYA PROMYSHLENNOST' congratulate Nikolay Konstantinovich Baybakov on this glorious anniversary and wish him good health, long life, and great personal happiness. We are certain that his rich production experience and organizational talent will continue to promote efficient solutions to timely problems of development of the gas industry.

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FUELS

HEAD OF UZBEK PETROLEUM ASSOCIATION SUMMARIZES RECENT WORK, FUTURE PLANS

Moscow NEFTYANIK in Russian No 3, Mar 81 pp 4-5

[Interview with Azis Ismailovich Ismailov, general director of the Uzbekneft' Association; date and place not specified]

[Text] On 28 November 1980 the collective of the Uzbekneft' [Uzbek Petroleum] Association reported fulfillment of its five-year plan for all technical-economic indicators. In the final year of the five-year plan alone the association extracted 909,200 tons of petroleum and gas condensate (101 percent of the plan), and increased the extraction of gas and volume of exploratory drilling.

In the article below general director Azis Ismailovich Ismailov tells about the life and work of the collective of the Uzbekneft' Association.

[Question] The volume of petroleum extraction in the republic is not large. But of course, Uzbekistan is one of the oldest oil regions in our country. The extraction of liquid fuel here began in the last century.

[Answer] Yes, the first oil gusher occurred in 1898 out of a shallow well drilled in the Fergana Valley not far from the village of Chimion. The next deposit discovered after Chimion was at Sel'-Roko. But extensive and planned petroleum exploration work did not begin until Soviet times. The Surkhan Dar'ya group of deposits is being worked intensively today. Petroleum deposits discovered in Kashkadar'inskaya Oblast in 1971 are now producing more than 300,000 tons of petroleum. In the new five-year plan we expect to raise extraction there to 500,000 tons.

We have a total of 1,425 operating wells. Just 0.7 percent of them are flowing wells. Most of the wells are located in old oil regions whose deposits have entered the late stage of exploitation. Therefore work with the wells requires special attention and care. The collective of the association is taking numerous steps to stabilize the level of petroleum extraction.

[Question] Could you please tell us about this in more detail?

[Answer] We have adopted a policy of rapidly increasing the volume of liquid pumped into the layer. Continuing maintenance of layer pressure is accomplished by pumping water (3.6 million cubic meters a year, including 2 million cubic meters treated with surface-active agents) and gas (1.8 million cubic meters). In 1980 we introduced 10 new injection wells, repaired 35 such wells, and the receptivity of 10 wells was increased. New methods of increasing petroleum yield are also being introduced. At the Khaudag deposit, for example, experimental flooding of the Dukhara layers with hot water has been initiated. The yield of operating well No 130, into which some 100,000 cubic meters of water has been pumped (this well is located 100 meters from the injection well) rose 10 times.

Progressive methods of influencing the zone near the face are being used extensively. Among these techniques are thermal acid, standard acid, and hot petroleum product treatment. Scientifically substantiated plans, and production diagrams for working deposits are being introduced.

All this makes it possible to raise the coefficients of petroleum yield by 5-10 percent. The broad use of these methods is also dictated by the fact that they are less capital-intensive and more efficient than methods used earlier.

We are getting additional tons of petroleum by introducing new small deposits and developing the lower and higher horizons in developed regions.

[Question] You mentioned small new deposits. Does this mean that the search for new petroleum-bearing structures in the republic is continuing intensively?

[Answer] It certainly does. Moreover, we are going deeper and deeper. Our first well in Chimion was just 250 meters deep; oil prospectors today have gone past 5,000 meters. Work is going on in the middle of the Fergana Valley where the petroleum-bearing structures lie at a depth of 5,000-6,500 meters, and in the northern part of the valley where the new Tergachi deposit was discovered and launched in operation during the 10th Five-Year Plan.

The Uzbek SSR Ministry of Geology does geophysical petroleum exploration for the association. Unfortunately, this work is not going as fast as we would like. The Ministry of Petroleum Industry has adopted a resolution to establish a geophysical service within the Uzbekneft' Association. The work of this service would supplement the prospecting by geologists of the Uzbek SSR Ministry of Geology.

The search for oil at great depths demands new, powerful drilling equipment. We do not have enough of it at the present time. This year we will receive several new drilling rigs and with them we hope to be able to discover new petroleum-gas structures. But the oil workers have already reached the subsalt Jurassic beds. A core with signs of petroleum and gas has been extracted from these beds at the Surkhan Dar'ya group of deposits. Geologists describe this deposit as a gas deposit with a petroleum fringe.

We were very pleased by the news from the geologist who found petroleum in the Barsa-Gel'mes region. They recently turned over three wells to us, and the planning and estimate documents for building up this deposit are now being prepared. So we do have future prospects and should expect petroleum extraction in Uzbekistan to increase.

[Question] Azis Ismailovich, it takes a large number of skilled workers and engineering-technical personnel to keep the wells in working condition; more than 99 percent of them are mechanized. Would you please tell us how your cadres are trained?

[Answer] The association has a training combine to train cadres. Almost all the educational institutions in the country train engineering-technical personnel for us, but most of our engineers and technicians are graduates of the Tashkent and Fergana polytechnic institutes and the Kokand Order of the Labor Red Banner Petroleum Tekhnikum imeni A. K. Azizkariyev. I should mention that our collective has many labor dynasties. This is a result of traditions in the republic. And even though the conditions of work for our associations differ greatly, from the fully developed Fergana region to the Karaha deposits that are still under development and the Barsa-Gel'mes region that has just been discovered, we cannot complain of high worker transience.

[Question] The enterprises of the association and particular brigades in the leading occupations have been winners in all-Union socialist competition a number of times. Could you please tell us which are the best collectives.

[Answer] Given the situation in our association the collectives of the brigades engaged in current repair and major overhaul (capital repair) of the wells are foremost. Among them I should mention the capital repair brigade of A. N. Kabanov, which fulfilled its plan for well repair by 200 percent and the brigade of E. Dzheparov, which raised productive time to 99.8 percent. The best brigade in the association for petroleum extraction is the collective headed by S. Erbayev of the Andizhaneft' [Andizhan Petroleum] Administration. The brigade increased the average yield per well serviced by 20.9 percent with an operating coefficient of 0.987. The drilling brigade of Fayl Khussainov fulfilled its drilling plan by 121.9 percent while reducing the prime cost of drilling work by 20,000 rubles. Our allied sectors also participate actively in competition. The brigade of construction workers headed by R. Umerov from construction-installation administration No 3 fulfilled its plan of construction-installation work by 127.5 percent. More than 30 of the 122 brigades in the leading occupations fulfilled their five-year plan assignments ahead of schedule. We should give special notice to the collective of the Andizhaneft' petroleum-gas extraction administration, which has been a consistent prize-winner in all-Union socialist competition, quarter after quarter, since 1977.

[Question] One final question, Azis Ismailovich, can you tell us what steps the association is taking to raise the level of domestic services to the petroleum workers?

[Answer] Our association's administration of worker supply serves the petroleum workers of both Uzbekistan and Tajikistan. The material-technical base of the

worker supply administration today has 126 stores, 104 dining halls with rooms for 3,813 customers, five bakeries, 30 warehouses, eight vegetable storage facilities, six potato storage facilities, and two fruit storage facilities. A great deal was done during the last five-year plan; we built a shopping center, a department store, two dining halls for 100 persons in Karshi and one dining hall for 30 persons in Zhdanovo. In addition 10 hot food points were opened (eight in Tajikistan, two in Uzbekistan). A hothouse with an area of 10,000 square meters was put into operation in late 1981 [as published]. The worker supply departments of the Andishan, Dzharkurgan, and Fergana petroleum-gas extraction administrations have set up subsidiary livestock farms. By the end of last year these farms had 114 head of cattle and 400 hogs.

During the current five-year plan development of the community of Kumkurgan in Surkhandar'inskaya Oblast will continue. A stadium, a bathhouse, a preventive health center (the association has five of them), and a nursery school for 140 children will be built. A Pioneer camp for 180 children was built there in 1976; its capacity has now been expanded to 240. The children of the petroleum workers have full access to Pioneer camps.

[Question] Thank you very much for your time. Allow us to wish all the petroleum workers of Uzbekistan good health and success in their work.

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STATUS, GOALS OF OIL INDUSTRY AT START OF 1981-1985 PLAN TOLD

Moscow NEFTYANOE KHOZYAYSTVO in Russian No 4, 1981 pp 3-9

[Article by N. A. Mal'tsev, USSR Ministry of Petroleum Industry: "The Petroleum Industry in the New Era"]

[Text] The decisions of the 26th CPSU Congress and the principled program positions that CPSU Committee General Secretary and USSR Supreme Soviet Presidium Chairman Comrade L. I. Brezhnev expressed in the accountability report of the Central Committee to the congress reflect the party's constant concern for the people's welfare and have enormous political and economic significance.

During the last five-year period and during preparations for the 26th CPSU Congress, the party and the Soviet people, whom it guides, did truly gigantic work in solving major, important social and economic tasks. In every branch of the national economy advanced collectives reported the fulfillment ahead of schedule of plans and socialist commitments that were adopted in honor of the 26th party congress. The oilfield workers made a worthy contribution to the enormous creative work of the Soviet people.

More than 26 billion rubles of capital investment, 9.4 million of it for construction and installing work, were assimilated in providing for the industry's development during the last five-year plan.

Well penetration was about 71 million meters, exceeding the five-year plan by 5.4 million meters. The absolute increase in oil and gas-condensate recovery for the industry during this period reached about 113 million tons. New capacity for refining 13.5 billion m³ of casing-head gas per year, which exceeded the degree of its utilization, was introduced into operation. Arterial pipeline length increased by 12,500 km, and the hauling of crude by rail decreased sharply.

The industry also executed a major social program--about 6 million m² of housing, kindergartens and schools for 67,000 children, many polyclinics and hospitals, and vitally needed cultural and personal-amenity services were introduced.

An important achievement of the oilfield workers was the accelerated development of oil recovery in West Siberia, where almost 313 million tons of oil and gas condensate were recovered in 1980, exceeding the five-year plan task. Through the selfless labor of Tyumen' drillers and of drillers from Tataria, Bashkiria, the Ukraine, Belorussia and Saratovskaya and Kuybyshevskaya oblasts, the amount of

drilling in Tyumenakaya Oblast rose from 2.6 million meters in 1975 to 7.9 million in 1980, more than tripling. This is the result of the creative labor of a multithousand collective of oilfield workers, builders and transport workers, the many laboring collectives of the country that are providing the oil and gas complex with machinery, equipment and materials, and the great political and organizing activity of party, soviet, trade-union and Komsomol organizations.

CPSU Central Committee General Secretary and USSR Supreme Soviet Presidium Chairman Comrade L. I. Brezhnev congratulated all participants on their great victory in fulfilling Tenth Five-Year Plan tasks for oil and gas recovery in Tyumenakaya Oblast ahead of time.

The industry has gained in past years great experience in building up the economy and in solving important social problems, and it has created an initial base for carrying out 11th Five-Year Plan tasks. However, a strict, demanding approach to an evaluation of the work done testifies that the achievements in developing the industry could have been more meaningful if economic reserves had been exploited more actively, deficiencies eliminated more persistently, and serious errors in the style of economic supervision prevented.

In 1985 the recovery of crude and gas condensate in the country is to be brought up to 620-645 million tons, and, in so doing, the large territorial production complex in West Siberia is to be developed at a higher pace. In 1985 the recovery here of oil and gas condensate should grow to 385-395 million tons. The oil-recovery industry in the Kazakh SSR and the north of the European part of the country is to be developed further.

In order to reach the new goals the industry is calling for the introduction into development of many new fields and a sharp step-up in the amount of drilling, mainly by raising the technical and economic indicators of drilling through growth of labor productivity, acceleration of the reequipping process and further improvement of work organization. New methods for stimulating the oil formations should be introduced more intensively, and highly productive methods for operating wells--gaslift and submersible electrical pumps--should be developed more intensively. It is planned to reduce labor expenditure for servicing a well by an average of 15-18 percent through further integrated automation of the oilfields, based upon new equipment for recovering crude.

A most important chapter of the 11th Five-Year Plan program is the plan for 1981. This year, out of 810 million tons of crude and of gas condensate produced in the entire nation, the share of Minneftprom [Ministry of Petroleum Industry] is 989 million tons. In order to realize this task, oil-industry enterprises have been allocated more than 7 billion rubles of capital investment, including 2.6 billion rubles for construction and installing work, which are more than the amounts actually assimilated in 1980 by, respectively, 14.5 and 28.7 percent.

It is planned, in 1981, to drill 20.2 million meters of hole, to create new capacity for recovering 105 million tons of oil and gas condensate, to introduce into operation crude-treatment installations with a capacity of 52 million tons per month, and to build more than 3,000 km of oil trunk pipelines with 32 oil transfer-pumping stations, about 2 million m³ of oil tank capacity and more than 400 km of roads.

A substantial amount of work is to be done during the year to improve the social and living conditions of the industry's workers: 1.8 million m^2 of housing, preschool institutions for 10,000 children, schools for 11,000 pupils, polyclinics for 800 outpatients per shift, storage for 5,000 tons of potatoes and vegetables, more than 8,000 m^2 of storage space in general-merchandise warehouses, and other social and personal-amenity facilities are to be put into use.

As we see, a firm foundation for successful work during the 11th Five-Year Plan must be established in 1981. A most serious task this year will be to increase the amount of work done in West Siberia. Oil-well penetration here should be increased to 3.7 million meters, and the recovery of oil and gas condensate will grow to 334.3 million tons. It is exceptionally important to solve questions of nonproduction construction and to create a road net in this region. Work volume will be increased 1.7-fold and 2.3-fold, respectively, over 1980's. It is planned to build this year 11 new workers' settlements and thereby put into operation 219,000 m^2 of housing and a complex of facilities for social, cultural and personal-amenity purposes.

What are the main guides for fulfilling these tasks?

The 26th CPSU Congress emphasized anew the necessity for radically improving organizational activity at all levels of management, raising the level and improving the style of production management, raising the effectiveness and quality of work, obtaining maximum output through intensive-development factors, and expending financial, labor, supply, and equipment resources economically. All this should provide for unconditional fulfillment of the plan tasks established for recovering crude and gas, for growth in labor productivity and for an increase in economic indicators. In so doing, strict monitoring and daily execution of the decisions of both higher organs and local authorities are necessary. The principles laid down in the CPSU Central Committee decree, "On the Status of Monitoring and Checking Performance in the USSR Ministry of Petroleum Refining and Petrochemical Industry," should become the basis for this work. A most important prerequisite to success is high plan, operating, technological, production and labor discipline.

One cannot be reconciled, in particular, with the cases of serious violations of technological discipline that have occurred during well drilling in Glavtyumenneftegas [Main Administration for the Oil and Gas Industry in Tyumenskaya Oblast], in Turkmenneft', Azneft', Gruzneft' and Nishnevolzhskneft' [Turkmen, Azerbaijan, Georgian and Lower Volga oil-production associations], and in certain other organizations, or those that have occurred in some refineries and plants of the VPO Soyuzneftegaspererabotka [All-Union Production Association for the Treatment of Oil and Gas]. Strict observance of technological and production discipline should be based upon the technical regulations approved for each process and the organizational and technical measures that provide for their observance.

Considerable work has been done in the industry to realize the CPSU Central Committee and USSR Council of Ministers decree, "On the Improvement of Planning and Strengthening of the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality." With a view to increasing the validity of current and long-range planning calculations, a comprehensive system for technological design and economic planning has been worked out and introduced, and the most important standardizing documents have been approved. This will create a reliable basis for implementing plan discipline.

Measures for increasing the effectiveness of capital construction and of drilling work have been taken, a system of economic incentives for work to increase the extent of extraction of oil from the ground has been introduced, and industrywide recommendations have been worked out for use of the material-incentive fund and the principles for awarding bonuses from this fund's resources. An appropriate plan of measures has been worked out for further improving brigade forms of organization and work incentives. Here the importance of the fullest application of brigade forms for organizing collectives should be stressed. The branch has taken steps to strengthen this most important low-level production element. Brigades for recovering oil and gas in the basic production activity have been rejuvenated, and the foreman's role has been raised.

However, analysis indicates that in some associations, Permneft' (Perm' Oil Production Association), for instance, and at VPO Soyuzneftegaspererabotka treatment plants, only 50-55 percent of the workers are covered by brigade organizations. This is an extremely low indicator. The industry's enterprises must use more widely the experience of other branches of industry with brigade forms for organizing work.

At the same time, improvement in organizing production and the entire economic mechanism should continue, with a view to uniting the interests of each worker and each collective with the achievement of high final results in recovering oil and gas, and with saving resources in every possible way. This will be a most important criterion of the industry's activity in the interests of the whole national economy.

There are still many specialists and supervisors who associate the potential for further raising technical and economic indicators only with technical progress, at a time when existing technical resources are not in many cases being used fully.

For example, the drilling-brigade collective supervised by G. M. Levin (now chief of Surgut URR [Drilling Administration] No 2), changing existing equipment, exceeded in 1980 the penetration goal of 100,000 meters. The brigade of foreman T. A. Andguladze, from URR No 1 of the Uelsk Drilling-Operations Trust, drills more than 18,000 meters per year. But, under similar conditions, only about 9,000 meters is drilled on the average per brigade in the URR, that is, little more than half as much. In the Izhevsk URR the brigades of foremen Yu. G. Gausknekht, V. P. Piskarenko and N. D. Akel'yov penetrated 31,000 meters in 1980, while, at the same time, the URR average was 23,500 meters. Consequently, for this reason alone, it is necessary to take a look at unused reserves, and the most serious attention must be paid to them. This step, along with further technical progress and improvement in equipment and technology, should help to raise labor productivity. Similar examples exist also in the areas of the recovery and transport of crude, the treatment of gas, repair of equipment, and so on.

In work organized to raise labor productivity, one of the first places should be given to constant concern for the workers, to creating suitable conditions for working, living and relaxation for them. The essence of this consists in a correct style and effective operating methods on the part of all supervisors. This includes concern about the progress of housing construction, the establishment of children's institutions, better organization of social eating at production places, and tens and hundreds of other questions, major and minor. The system for raising the workers' vocational, politico-ideological, cultural and general-education levels has a special place here.

The oil industry has at its disposal a major economic, scientific and technical potential. The value of fixed production assets is more than 37 billion rubles. Oilfield workers have at their disposal more than 82,000 wells, more than 2,000 drill rigs, tens of thousands of different mechanisms, vehicles and other equipment, huge gas-treatment plants, trunk oil pipelines, and plants for repairing equipment and producing special materials. In order to improve the yield of the available production capacity, attention must be given to the following:

1. Radical Improvement in the Use of the Inventory of Drilled Wells

This will enable more rational development of fields, better control over the process of working each part of the formation and of the deposit as a whole and more effective use of oil reserves. In this connection, Tatneft and Bashneft' [Tatar and Bashkir oil production associations], Urayneftegas [Uray Oil and Gas Production Association], and Udmurtneft' and Ukrneft' [Udmurt and Ukrainian oil production associations] have increased greatly their exactingness toward fulfillment of the engineering plan for development, and the monitoring thereof has been greatly intensified.

However, not everywhere is this work being done at the proper level. Thus, in Nizhnevolgskneftegas and Surgutneftegas [Nizhnevolgsk and Surgut oil and gas production associations] and Tomakneft' [Tomak Oil Production Association], the periods for drilling fields over lags behind what the development plan calls for. Work on mastering waterflooding systems lags in Turkmenneft', Mangyshlakneft' [Mangyshlak Oil Production Association], Permneft' and Azneft'. Not everywhere are oilfield hydrodynamics and geophysical research being carried out in well-rounded fashion, nor are certain scientific-research institutes and geological services of NGDU's [oil and gas recovery administrations] and associations fully using research results for analyzing and development planning. Production associations and scientific-research institutes must constantly and thoroughly analyze the working of oil reserves at each bed, section, lens and block and effect in good time measures for improving development. In so doing, the involvement primarily of oil reserves that are not covered by the displacement process should be kept in mind.

In Tatneft', Bashneft' and Udmurtneft' and other oil-production associations, a good system for planned preventive maintenance and the overhaul of wells has been organized, and measures have been taken for cooperation of the forces of the various production elements to extend the time between repairs of well equipment. In other associations, for example, Tomakneft', Komiyeft' [Komi Oil Production Association], Permneft', Turkmenneft', Azneft', and Embaneft' [Emba Oil Production Association], the required attention has not been paid to this important question. From 4 to 7 percent of the wells are idle simultaneously, which, greatly exceeding the industry's standards, is 1.5-fold to 2-fold the industry average.

There is a similar situation with respect to the inactive inventory. Thus, in 1980 up to 16 percent of the production wells at the NGDU of Strezhevoyneft' [Strezhevoy Oil Production Trust] of Tomakneft' were idle for various reasons. In Kuybyshevneft' [Kuybyshev Oil Production Association], some wells were in conservation status because of a lag in active measures to put wells into operation. In Turkmenneft' many wells have collapsed casing, which prevents their normal operation and restricts the withdrawal of liquid from the formation. However, work to restore them is being done extremely slowly. Wells in the Glavtyumenneftegas inventory operate poorly, a large number of them being operated at less than complete production capacity.

The main task of Nizhnevarlovskneftegaz and Surgutneftegaz is the speeded up construction and introduction into operation in 1981 of complexes for gaslift operation at the Samotlor and Fedorovskoye fields. This will enable productive operation of water-encroached wells and improved development of the fields.

During the 11th Five-Year Plan the industry's operating-well inventory will grow from 82,000 to 122,500. Wells that are operated by the mechanized method (mainly with UETsN's [electrical centrifugal-pump installations] and ShSN's) will comprise about 89 percent. While the pumping equipment will have better technical characteristics and reliability, greatly intensified work on the correct selection and establishment of optimal regimes for pumping and on improvement of the technological conditions for its utilization will be required. The task of rational utilization of UETsN's and ShSN's is complicated, and many services of the NGDU's and production associations and repair plants, as well as workers of scientific-research and design-development organizations, should participate actively in accomplishing it.

Despite a certain growth in shiftwork utilization of brigades and equipment in well repair in 1980, it is still low in Azneft', Krasnodarneftegaz [Krasnodar Oil and Gas Production Association], Stavropol'neftegaz [Stavropol' Oil and Gas Production Association] and Imbaneft'. Repair capacity is being used practically on one shift here, although it is in these associations that the need for well repair is high. The level of organization and work quality in the current repair of wells is inadequate in Glavtyumenneftegaz, Tomskneft' and Permneft', at which time spent on immediate repair in the total time spent by the brigade is only 35-45 percent. It is necessary to improve sharply in this important area, not through an increase in the number of brigades but through improvement in labor productivity and repair quality and increased time between repair of equipment at the wells.

2. Improvement of the Utilization of Capacity for Recovering and Treating Casing-Head Gas

New capacity was established in the industry during the Tenth Five-Year Plan for treating casing-head gas, especially in West Siberia. Right now the main task, besides a further increase in capacity, is to provide for its effective use. Not everything is satisfactory here. The natural gasoline being produced at West Siberia's gas-treatment plants is not being completely realized because of the lack of local capacity for gas-fractionation and the impossibility of exportation. Moreover, certain associations lag in the construction of gas-gathering systems. Because of this, measures are being planned to enable natural gasoline and oil stabilization products to be transported from West Siberia to the Urals-Volga region for charging up the GPZ's [gas-treatment plants] that are operating there and eliminating the lag in development of the gas-gathering system. VPO Soyusneftegaz-pererabotka, Glavtyumenneftegaz and Siberian production associations should carry out the decisions adopted without fail.

3. The Reconstruction and Modernization of Petroleum Production.

The managers of enterprises and scientific-research and design institutes often see new construction as the principal solution to urgent problems in the development of production. As a result, the lists of construction-project titles grow, and the resources and efforts of the builders are dispersed. Such trends

are being clearly manifested, for example, in 'Tatneft', 'Permneft' and 'Kuybyshevneft', that is, exactly where it is necessary to deal wisely with everything that has been created in preceding years.

There are other examples, also. Thus, 'Giprovoostokneft' [State Research and Design Institute of the Oil-Production Industry of Eastern Regions of the USSR] recommended development of the Kazakh GPZ's capacity through new construction at a budget-estimated cost of 96 million rubles. After attentive study of the problem, a different decision was adopted--to reequip the existing plant with highly productive equipment at a modernization cost of about 15 million rubles. As a result, great economic benefit was obtained. Consequently, it is necessary to be guided by the 26th CPSU Congress's instructions about aiming capital investment primarily at rebuilding and reequipping enterprises with machinery.

There is much work here--improvement of oil-recovery processes, introduction of the gaslift method, intensive stimulation of the bottom-hole area for increasing well productivity, modernization of the system for gathering and treating oil and gas with the execution of high-severity separation and partial stabilization of the crude, wide chemicalization of industrial processes, and the solution, based thereon, of such complicated problems of the branch as the campaign against salt and paraffin deposition and the corrosion of pipeline systems and equipment. Of course, it is not proper in all cases to present reconstruction and modernization as an alternative to new construction. The amounts of capital investment in production facilities and in the creation of infrastructure at new fields and regions will grow constantly.

Progressive development of the oil industry requires constant augmentation of the raw-materials base with new explored reserves, the creation of oil-recovery capacity through drilling, the introduction into operation of new wells, and the construction of facilities for the integrated buildup of facilities at the oilfields and in the oil regions. Enormous financial, supply and equipment resources are being allocated for strengthening the industry's raw-materials base.

Examples of the rational use of these resources are 'Bashneft' and 'Grozneft' [Grozny Oil Production Association]. Thus, 'Bashneft' concern about preserving a high level of oil recovery is closely tied in with growth in reserves and with provisions for the successful execution of a large amount of geological exploration and geophysical operations. This work should be organized in each association, drilling administration and oil-and-gas production administration.

Unfortunately, there are still other examples in the branch. For many years 'Embaneft' has been doing long-range exploration of subsalt sediments. However, plans for drilling here have not been fulfilled, and there have been many cases of discarding in the construction of exploratory wells. As a result, promising deposits discovered by isolated holes still have not been evaluated and cannot be put into development. This has also been observed in 'Turkmenneft' during exploration for evaluation of the presence of oil and gas of subjacent sediments of the lower redbeds. In areas of west Georgia, Krasnodarskiy and Stavropol'skiy krays and Azerbaijan, the low effectiveness of exploration is linked with inadequate validity of the geophysical and geological data. There are clear errors here not only by the associations but also by 'SevkavNIPineft' [North Caucasus Scientific-Research and Design Institute for the Oil Industry], 'AzNIPineft' [Azerbaijan Scientific-Research and Design Institute for the Oil Industry], and the head institute, 'IGIGI' [Institute of Geology and the Development of Mineral Fuels].

The first year of the 11th Five-Year Plan should be a break in the activity of Embanefit', Turkmenneft', Permneft', Mangyshlakneft' and West Siberian and other production associations on whose work the possibility for an increase in new oil reserves directly depends.

The 1981 plans call for the recovery of more than 43 million tons of oil and gas condensate from wells newly put into operation. For this purpose, more than 8,600 new wells must be introduced, after 20.2 million meters are drilled. Penetration will grow in Komi-neft', Mangyshlakneft', Orenburgneft' [Orenburg Oil Production Association], Udmurtneft', Azneft', Embanefit' and certain other oil-production associations, but it will grow especially substantially, as has already been noted, in West Siberian regions. The tasks established for drilling should be carried out by the use of existing reserves, insuring a high degree of organization and coordinated and rhythmic operation, the timely construction of roads and of earthen platforms for clusters of wells, the development ahead of time of power facilities, and precision in organizing the supplying of materials and equipment.

An important reserve in building up penetration is a rise in the vocational mastery of drilling brigades. In 1980, out of 1,323 drilling brigades, only 1,050, or 79.3 percent, carried out their tasks. Out of 115 UBR's, 29 did not carry out the plan. In Glavtyumenneftegaz, 11 out of 16 UBR's failed to cope with the task, as did 2 out of 3 in Tomskneft', 2 out of 4 in Orenburgneft' and 4 out of 5 in Turkmenneft'. There are in the industry many notable drilling-brigade and administrative collectives that are constantly fulfilling plans and socialist commitments. Their experience should be the property of all brigades, and, the main thing, it is necessary to achieve high results in UBR's as a whole.

One of the decisive areas for steady production work is capital construction. The party and the government are paying it constant attention and are investing enormous sums in it, and the branch's development, the pace of scientific and technical progress, and production effectiveness depend upon the extent to which the sums are used. At one time, wide introduction of the outfitted-module method raised industrialization of construction in the oil industry to a high level, and it greatly reduced the time for building up oilfield facilities. During the 11th Five-Year Plan it will be necessary to convert from the manufacture of individual modular apparatus and installations to the production and delivery of sets of oilfield facilities. Exceptionally serious attention must be paid to this.

Among the key problems for raising oil production effectiveness are the creation and development of the road net. Without roads one cannot promote either drilling or construction work, much less accomplish them effectively. This is of special importance in West Siberia and other regions where weather and climatic conditions are complicated.

Much help is being given here to the industry. Apart from Mintransstroy [Ministry of Transport Construction] organizations, construction organizations of some Union republics will build roads in West Siberia, and the oilfield workers, as the clients, should especially monitor the quality of the work and help the new organizations to use positive experience in building roads under difficult conditions.

Technical surveillance over road construction has been poorly organized in Glavtyumenneftegaz associations. The service for operating and repairing roads must be strengthened, since the amount of repair is constantly increasing. This is true

not only of West Siberia but also of practically all oil-bearing regions. Work to create reliable electrical-supply and communication systems must be intensified.

The client's service is of great significance in organizing construction. It is necessary not only to give the builders a plan but also to create conditions for its fulfillment and for timely introduction of the facilities into operation, to regulate the mutual actions of the participating organizations, and to establish the degree of responsibility of each of them for the final results. Success of the construction depends upon how energetically responsible workers and all the services of client enterprises act during the construction process. Where client enterprises do not pay due attention to construction and, moreover, do not carry out their obligations for turning over documents, equipment for installation, transportation routes and construction sites to the builders on time, matters go poorly.

The main task of the design institutes is a further rise in the quality of technical papers, the introduction of progressive solutions, and reduction in the cost and metals intensiveness of the facilities being planned. In the case of facilities proposed for construction in 1982, they must, together with client enterprises, issue prior to 1 July 1981 technical documentation that has been coordinated with contracting organizations and approved.

A major socio-economic question, as 26th party congress decisions noted, is the construction of housing and cultural and personal-amenity facilities. It is extremely important to observe an integrated approach here. And this means that, as operations increase, housing, children's preschool institutions, facilities for cultural purposes, public health, education, shopping, and municipal and personal-amenity services must be introduced on time. Only in this way is it possible to create really favorable conditions for people's working and living conditions.

Scientific and technical progress are of vast importance in raising production effectiveness. Working out the industry's most important problems has been amalgamated into two national-economic programs: the creation and mastery of technological processes and of the technical resources for drilling oil and gas wells, and the creation and wide application of technological processes and of technical equipment for increasing the withdrawal of crude from formations.

Moreover, during the 10th Five-Year Plan, enterprises introduced each year 800 scientific developments which provided during the five-year period for a tentative economic benefit of more than 300 million rubles and reduced the requirement for labor resources to an estimated 2,500 persons per year. At the same time, the effect of scientific and technical progress on work effectiveness will grow if, along with the introduction of new equipment and technology, the technical potential of existing equipment, which contains no few reserves for productivity, will be used completely. It is necessary to mark off the spheres of influence precisely of the organization of production and of new equipment and technology. This is very important, since one of these concepts often is substituted for the other and the desired results are not achieved. For example, in recent years Kuybyshevneft' UBR's were completely reequipped, taking drilling conditions into account, and they converted to the highly effective low-rpm rotary drilling method. New high-quality tube and highly productive drill bits were allocated to them. As a result, penetration per bit increased 1.5-fold or more, but, because of worsening of the organization of operations, the technical and economic indicators remained, on the whole, at the former level.

Collectives of the industry's best drilling brigades, using serially produced equipment, are achieving results that exceed the average 2-fold. One cannot help but see here an enormous field of activity for scientific-research institute scientists, primarily of VNIIBT [All-Union Scientific-Research Institute for Drilling Equipment] and VNIIRneft' [All-Union Scientific-Research Institute for Oil-Well Casing Operations], with a view to raising indicators everywhere.

Examples can also be cited from the oil-recovery field, where the use of new technical resources and technological processes remarkably improved indicators in one case but did not in another case. Thus, in recent years the technical level and quality of URSN's improved somewhat (albeit, as before, oilfield workers had complaints against the suppliers), but even in advanced associations the operating period between repairs was lower than in Tatneft', where in 1980 it reached 336 days, while in Bashneft' the figure was 285 days, in Permneft' 251 days and in Nizhnevartovskneftegaz 190 days. And although the structure of the measures, methods and procedures were essentially identical in all these associations, the level of work organization and of responsibility were different, and so the results also were different.

Much work has been done in the industry on the program of measures worked out for increasing withdrawal from the formations. At the same time, because of inadequate persistence on the part of NPO Soyuztermneft' [Science and Production Association for the Use of Thermal Methods in Oil Recovery] and Mangyshlakneft', Embaneft', Romineft' and Nizhnevartovskneftegaz, not one oilfield at these enterprises is operating in accordance with the plan worked out. On the basis of a comprehensive analysis of this important national-economic problem, a new program has been planned for 1981-1985. The task of NPO Soyuztermneft' and of all the associations where work is being done to increase withdrawal by thermal methods is to carry out the intended measures unconditionally.

A great potential for raising production effectiveness is associated with solution of the problems of chemicalizing the technological processes in drilling wells and recovering crude. The work of NPO Soyuzneftepromkhim [Science and Production Association for the Use of Chemical Methods in Oil Recovery] should be actively promoted, primarily in this direction.

In the area of developing science, an important measure that is called upon to greatly speed up the pace of technical progress in the branch is the conversion of scientific-research organizations and enterprises to the cost-accounting system of organizing work in order to create, master and introduce new equipment on the basis of orders and authorizations (or agreements). Much work is to be done here to insure that this system will enable the industry to obtain the benefit that was considered in 11th Five-Year Plan calculations.

One of the main reserves for speeding up economic development is the thrifty and rational use of everything that is at the industry's disposal and that is being newly delivered by the national economy. Thriftiness is necessary in everything, but this does not mean an accumulation of materials and equipment in warehouses: it means the rational and economical use of it. Above-normal residues of uninstalled equipment are still great in the industry. Production and industrial associations and enterprises and organizations should objectively analyze the factors that created the above-named residues and plan concrete measures to reduce them and to provide for strict monitoring over execution. The status of preservation of the

equipment and of valuable material commodities and materials is of special significance here, since it depends directly upon the provisioning of warehouse space and the equipping of the bases. However, many associations, enterprises and organizations are assimilating capital investment for warehouse construction by only about 25-50 percent. Strict order must be imposed in this area. When basing and storage activities are being developed, improvement of the work of the services that supply materials and equipment should be given primary attention in the developing regions of West Siberia and the Komi ASSR and in the Permneft' association and Glavtransneft' [Main Administration for the Transporting and Delivery of Petroleum].

Guided by the decisions of the October 1980 CPSU Central Committee Plenum, and with a view to reinforcing and multiplying the successes attained during the pre-congress competition, the collective of Yuganskneft' [Yugansk Oil Production Association] has come out with an initiative for the adoption of counterplans, the promotion of socialist competition for a further rise in production effectiveness and work quality, and the successful fulfillment of plans and commitments in 1981--the first year of the 11th Five-Year Plan. This initiative has been supported by all the associations, enterprises and organizations of the industry. The oilfield workers carried out their commitments to recover 450,000 tons of oil and gas condensate above plan by the day the 26th CPSU Congress opened. The national economy received by this noteworthy date almost 500,000 tons of oil above plan, and the plan for gas recovery also was overfulfilled. The industry's drilling enterprises also began the year successfully.

It is the task of all labor collectives to build on the successes achieved, to carry out the plan and socialist commitments for 1981, and to apply all efforts, knowledge and experience to further developing the country's fuel and power complex and the raw-materials base for petrochemical and chemical production.

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TECHNOLOGY OF UKRAINIAN COAL MINES, PLANNED IMPROVEMENTS REVIEWED

Kiev UGOL' UKRAINY in Russian No 4, Apr 81 pp 2-5

[Article by A. F. Ostapenko, candidate of technical sciences and chief of the Technical Administration of the Ukrainian SSR Ministry of Coal Industry: "Main Lines of Development of the Ukrainian Coal Industry"]

[Text] The Communist Party and Soviet Government have always devoted great attention to the development of the coal industry, technical re-equipping of the mines and concentrating sectors, and improving the working and living conditions of the miners. In the 10th Five-Year Plan there were definite qualitative changes in the development and technical re-equipping of the mines in the republic coal industry. The Chervonograd concentrating factory and large, highly mechanized mines such as the imeni Geroyev Kosmosa, imeni Leninskogo Komsomola Ukrainy, Velikomostovskaya No 10, Komsomolets Donbassa, Sukhodol'skaya-Vostochnaya, Krasnyy Partizan (first phase), imeni XXV S'yezda KPSS, and Nagol'chanskaya No 1/2 were put into operation after construction and reconstruction. In this time 265 horizons were built; 70 large-diameter vertical shafts were sunk; 110 obsolete hoists, 300 main ventilation fans, and 19 compressors were modernized and replaced, and 556 vertical shafts and 15,700 kilometers of excavation were overhauled.

The level of coal extraction by mechanized complexes was raised to 57.7 percent, including 17.4 percent for steeply dipping layers. The level of combine excavation was raised to 24.7 percent, while conveyor transportation of coal in inclined excavations was raised to 53.4 percent and in horizontal excavations to 19.1 percent.

It is common knowledge that the mines of the Donets basin go an average of 10-12 meters deeper each year. At greater depth mine pressure and temperature rise, gas discharge increases, the number of dangerous layers, rock and coal outbursts, and gas blowouts is greater. These phenomena have a negative effect on technical-economic indicators. The 11th Five-Year Plan envisions further improvement of mine resources and an increase in coal extraction and processing capacities as the result of accelerating the construction, reconstruction, and technical re-equipping of the mines and concentrating factories.

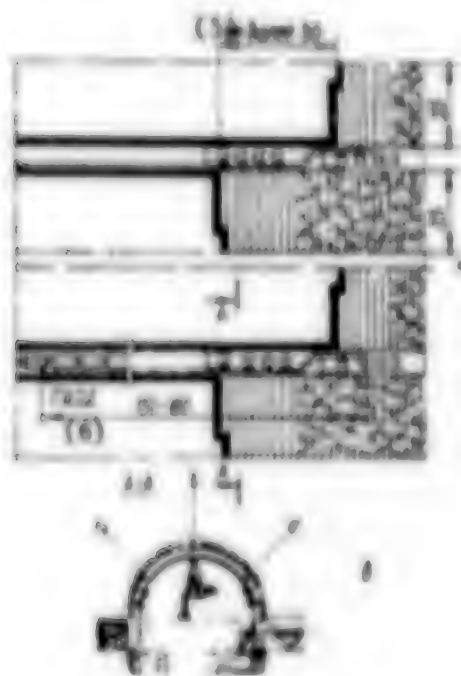
In 1981-1985 construction and launching in operation should be completed for the following mines: Dolzhanskaya-Kapital'naya, Samonovskaya-Zapadnaya, Shakhterskaya-Glubokaya, Kraenoarmyskaya-Zapadnaya No 1, Yuzhno-Donbasskaya No 3, Zapadno-Donbasskaya No 21/22, and Medvezheyarskaya. In addition, the concentrating factories of the Dolzhanskaya-Kapital'naya and Nagol'chanakaya No 1/2 mines are to be built and launched in operation, and reconstruction will be completed on the imeni Kosior, imeni XXII S'yezda KPSS, No 21, Krasnyy Partizan (second phase), Novo-Dzerzhinskaya, and imeni Voroshilov mines and the Bryanka and Kal'miuskaya central concentrating factories. Moreover, construction will be initiated on nine shaft mines, two open-pit mines, and four concentrating factories while reconstruction will begin on four mines and two concentrating factories.

Plans envision the following steps to improve the technical condition of operating mines: construction of 285 horizons; sinking 89 shafts; drilling 60 large-diameter vertical shafts; launching 174 main ventilation fans, 30 permanent refrigeration units, and 36 degassing units; work to improve surface facilities at 24 mines. The share of coal extraction from fully mechanized faces should be raised to 65 percent, which includes 35 percent for steep layers and 55-60 percent for thin, gently dipping layers. The level of preparatory excavation by combines is to be raised to 32-34 percent, the level of conveyor transportation of coal and rock in inclined excavations to 55-60 percent, and use of conveyors in horizontal excavations to 25-30 percent.

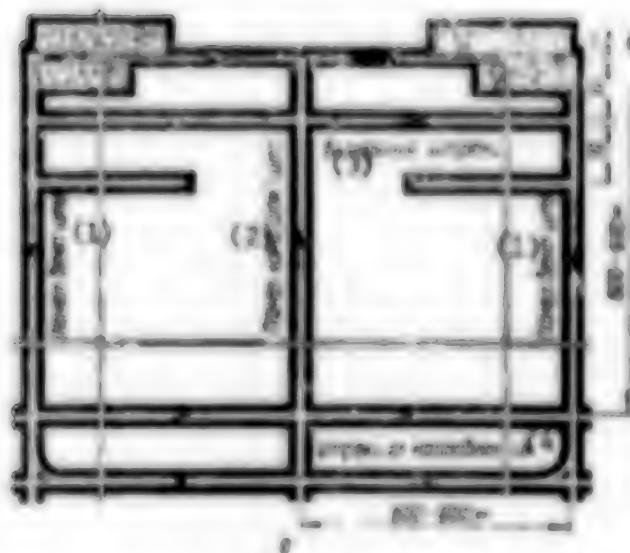
For working gently dipping layers 0.7-1.2 meters thick the following units are to be put in series production: the LKM-88, LKM-103, and KMK-98 mechanized complexes and the KD-80 for excavating layers with wall rock that is unstable or less than average in stability; K-103 and BKT mining combines; and, the modernized SO-75 cutting unit with two working elements. A comprehensive program was compiled in 1977 for the development of mechanized equipment for mining in steep layers. This program envisions refinement of the KGU complex and development of the KG complex for unstable wallrock, standardized crushed aggregate, and cutting complexes with pneumatic canister timbering. Because excavation equipment with individual timbering will still be used for a long time on gently sloping layers less than 0.85 meters thick, a comprehensive program was also worked out for the development and introduction of individual timbering on a new technical level, adapted for use under complex conditions with an unstable roof, weak soil, and thin layers that vary sharply in thickness. This program envisions for 1981-1983 incorporating series production of the VV-2 and VV-30 metal hinged roof timbers, metal spring-operated roof timbers, hydraulic posts with a resistance of 30 ton-force with an enclosed hydraulic system and external power supply, double-extensible hydraulic posts, and Sputnik-N fitted timbering.

We should single out work aimed at solving the very complex technical and social problem of excavating coal from very thin layers without human participation. The USSR Ministry of Coal Industry has ratified a program of projects to step up work on this type of coal excavation. Eleven scientific research institutes and four planning-design institutes of the sector, five institutes of the USSR Academy of Sciences and Ukrainian Academy of Sciences, and three institutes of

The screw drilling units are undergoing industrial testing in the mines (see Figure 2 below).



Key: (1) Paneled Air Vent;
(2) Paneled Conveyor (Open)
Drift;
(3) Extraction Drifts;
(4) Drifts of Main Sector;
(5) Not More than 50;
(6) GSh2D (Expansion Unknown).



A great deal of work has been outlined to develop means of remote and automatic control of coal mining equipment. It has been possible to solve a number of fundamental problems through the efforts of scientists and designers. They have devised situation sensors, logic elements, devices for protection, warning, and loudspeaker communication, and remote control equipment in spark-proof and explosion-proof versions that make it possible to accomplish the proposed functional diagrams for remote and automatic control of mining face equipment.

The expansion of shaft-cutting by combine is the main factor in raising labor productivity during excavation work because the use of combines reduces labor expenditures almost by one-half. Plans contemplate raising the proportion of preparatory excavation done by mechanized means to 32-34 percent in 1985, this growth being primarily the result of introduction of the 4PP-2 and KN combines. It should be observed that we still do not have shaft-cutting combines for rocks with hardnesses of greater than six. Therefore, an important way to raise the technical-economic indicators of preparatory excavation work is to build shaft-cutting combines for work in rocks with hardnesses of 6-10. These combines should be able to cut an average of at least 150 meters a month. In 1981 an experimental batch of standardized combines based on the Soyuz-19 will be manufactured and the KRT combine will be tested. B68KP drilling machines are to be introduced in the 11th Five-Year Plan.

In connection with the intensification of coal extraction and increasing depth of mining, questions of reinforcement and protection of mine excavations are becoming increasingly important. Already 70 percent of the supported preparatory excavations are reinforced with flexible arc timbering. The second most commonly used method is trapezoidal timbering with hollow reinforced concrete posts and metal roof timbers. During the Ninth and 10th five-year plans the labor-intensity of supporting excavation was reduced by 30 percent, and the frequency of re-timbering in a year was reduced by 10 percent.

Scientific research and development work by the Donets Scientific Research Coal Institute makes it possible to substantiate the future possibility of supporting excavations without repair. Special timbers with directed design flexibility of up to 1,000 millimeters have been developed to accomplish this technical goal. The problem of insuring the stability of mine excavations is very important in the general program of mine preparation work. Commonly used techniques are taking the load off the rock and closing the excavation and protecting excavations with double strips of variable-density crushed rock and strips of quick-hardening material. These methods of increasing the stability of excavations will be developed further.

Special attention will be devoted to the question of leaving rock in the mine to reduce transportation expenditures and the negative impact on the environment when the material is piled on the surface. The Titan crushing-packing complexes have done a good job during excavation work. Making paired excavations on a broad face is a promising way to solve the problem of leaving rock from shaft-cutting in the mine. The Donets Scientific Research Coal Institute, together with the Kopeysk Machine Plant imeni Kirov, the State Planning Institute for Coal Machinery, and other organizations, has developed technology and a set of

KSV (paired excavation complex) equipment for making paired excavations with faster cutting of the common coal face and filling the excavated area between them with rock.

Technical re-equipping of underground mine transportation has been accomplished by using conveyors to haul coal in horizontal and inclined excavations and by the introduction of hauling by locomotives with increased coupling weight using large-capacity cars and mechanized auxiliary transportation. This has made it possible to raise the number of faces with single-stage transportation to 74 percent and increase the level of conveyor transportation in horizontal excavations to 19.1 percent, the level of conveyor transportation in inclined excavations to 53.4 percent, and the productivity of electric engines to 17,400 ton-kilometers a month.

The main orientation in the 11th Five-Year Plan is to improve industrial schemes for primary and auxiliary transportation to establish efficient systems for transportation of rock and hauling materials, equipment, and personnel in the mines. Improvements in industrial schemes of transportation are to be made at 74 mines in the Donets basin on the basis of rationalizing mining procedures, increasing and concentrating underground freight flows, and maximum use of the capabilities of series-produced transportation equipment.

Work on the development and incorporation in series production of new highly efficient transportation equipment is being completed. Among the units to be produced are V-14 auxiliary electric engines, D-8 mine diesel engines, ARV-7 explosion-proof battery-operated electric engines, and telescopic conveyor lines based on standardized unit modules. Broad introduction of this equipment will make it possible to replace the obsolete AM-8 and SARV electric engines, KLA-250 and KL-150 belt conveyors, and other equipment. The planned program of technical re-equipping for underground transportation will make it possible by the end of 1985 to raise the level of use of conveyors in horizontal excavations to 25-30 percent, the level of conveyor use in inclined excavations to 55-60 percent, and the productivity of electric locomotives to 23,000 ton-kilometers a month.

Changes are taking place not only in machinery, but also in the technology of underground coal extraction. In recent years improvements in the preparation of gently dipping and inclined layers have been accomplished by switching to the paneled and horizontal methods. The only limiting factor in the use of the horizontal method of preparation is the dip of the layer. At the present time, this method can be used efficiently where layers are worked by longwalls up the dip at dip angles of as much as eight degrees. The main reason for this is that the series-produced excavation equipment is unsuitable for use at greater dip angles.

Projects by scientific research and planning-design organizations to modernize sets of equipment for use of excavating coal by longwalls up the dip in seams with dip angles of up to 12-15 degrees will permit a significant increase in the volume of use of the horizontal method of preparation.

More than 70 percent of all coal is extracted by the pillaring method. However, we must observe that the transition to pillaring systems in many cases increases coal losses in the pillars between walls. Experience and research indicate that as the work shifts to deeper horizons the space-planning concepts that protect excavations with pillars of coal become more and more inefficient because coal losses in the mine and the volume of excavation work done increase.

A technical-economic evaluation of mining schemes without pillars has been done and the area of technically feasible and economically advantageous application of these schemes was produced. The possible extent of application of improved schemes of pillar-less technology is about 20 percent of all walls in layers with dips up to 35 percent.

Practical implementation of developments in the area of using protective layers will promote further improvement in space-planning concepts and improve work safety in mining suites that contain layers that are prone to sudden coal outbursts and gas blowouts. The document "Promising Schemes for the Use of Protective Layers at Mines of the Donets Basin" was completed in 1979. It defines a system concretely for each mine with respect to working the layers in a suite based on their relative outburst-blowout danger, the completeness of protection, and the current state and prospects for development of mining work. The most rational methods of preparation and systems of mining, contemplating extraction work without pillars, are recommended for the layers used as protective layers.

Taken together, all the measures to improve the planning and procedures for mining work and broad realization of scientific developments will make it possible by the end of the 11th Five-Year Plan:

1. to increase the extent of use of the paneled and horizontal methods of preparing gently dipping and inclined layers to 50 and 35 percent respectively;
2. to increase the proportion of the pillaring system in total coal extraction to 80 percent;
3. to insure that 60 percent of the excavated sectors use pillar-less schemes;
4. to double, compared to 1975, the number of cutting faces in explosion-proof layers worked with full protection.

More than 20 percent of mine personnel are employed on the surface, and the proportion of manual labor exceeds 40 percent. During the Ninth and 10th five-year plans work was done to prepare a scientific-technical foundation for improving a number of surface processes at the mines. Technological plans have been worked out to exchange and move mine cars in the pithead buildings, to clean rock from oversized and outside objects, and to form flat rock dumps. Exploratory studies have been done on design of fundamentally new machines based on linear induction engines.

Equipment to mechanize work in exchange complexes — aggregates, pushers, interchange platforms, track stoppers, and the like — has been turned over for series production. This will make it possible to eliminate self-propelled hauling in the mines and to move mine cars under power for their entire routes of travel. Progressive technological processes for warehouse handling of timber have been developed on the basis of summarizing progressive know-how and research projects. A series of normative-methodological materials has been prepared on the design and operation of timber storage areas, and more than 10 types of equipment to mechanize storage work have been built. As a result, the proportion of heavy manual labor in primary loading-unloading work has been cut in half.

At the same time, the level of mechanization, technical equipment, and technology employed in surface work at the mines of the republic still does not meet the requirements of accelerated technical-re-equipping of coal enterprises. This is the result of the slow pace of reconstruction of industrial complexes, centralization of auxiliary services, and construction of facilities for storing materials, as well as the inadequate volume of manufacture of new equipment and delivery of series-produced equipment. Therefore, special attention will be focused on these matters.

The safety of work by miners will be improved significantly thanks to scientific-technical progress in the coal industry. The creation of safe and comfortable working conditions presupposes improvement in steps to control gas, dust, dynamic phenomena, and high temperatures while also meeting increased requirements for industrial sanitation. The Donets Scientific Research Coal Institute has proposed plans to ventilate the mine faces with fresh air. These systems are based on the use of specially cut or supported excavations in the excavated space and make it possible (with high gas discharge from the excavated space) to raise the upper limit of the tolerable load on the wall 50 percent and more with respect to the gas factor.

In 1981-1985 the mines will introduce standard mechanized and automated lock devices and implement industrial schemes for using them in practically all the mine geology conditions of the Donets basin in excavations with any type of transportation. This will have a significant impact on improving the ventilation of underground faces and will improve labor safety. Work to normalize heat conditions in the deep mines of the Donets basin is to be basically completed. The basic decisions have been made to insure that normal heat conditions are maintained in the mines, and a program for material support of the mines has been outlined.

To insure fulfillment of the assignments that have been established for further development of the republic coal industry, in conformity with the decision of the board of directors of the Ukrainian SSR Ministry of the Coal Industry a program of basic steps has been developed for each mine to eliminate bottlenecks, carry out technological re-equipping, improve the mining system, and develop the mines in the 11th Five-Year Plan and the years until 1990. This will make it possible, on the basis of improved technological concepts and using a new generation of machinery, to raise the republic's coal industry to a qualitatively new level of development.

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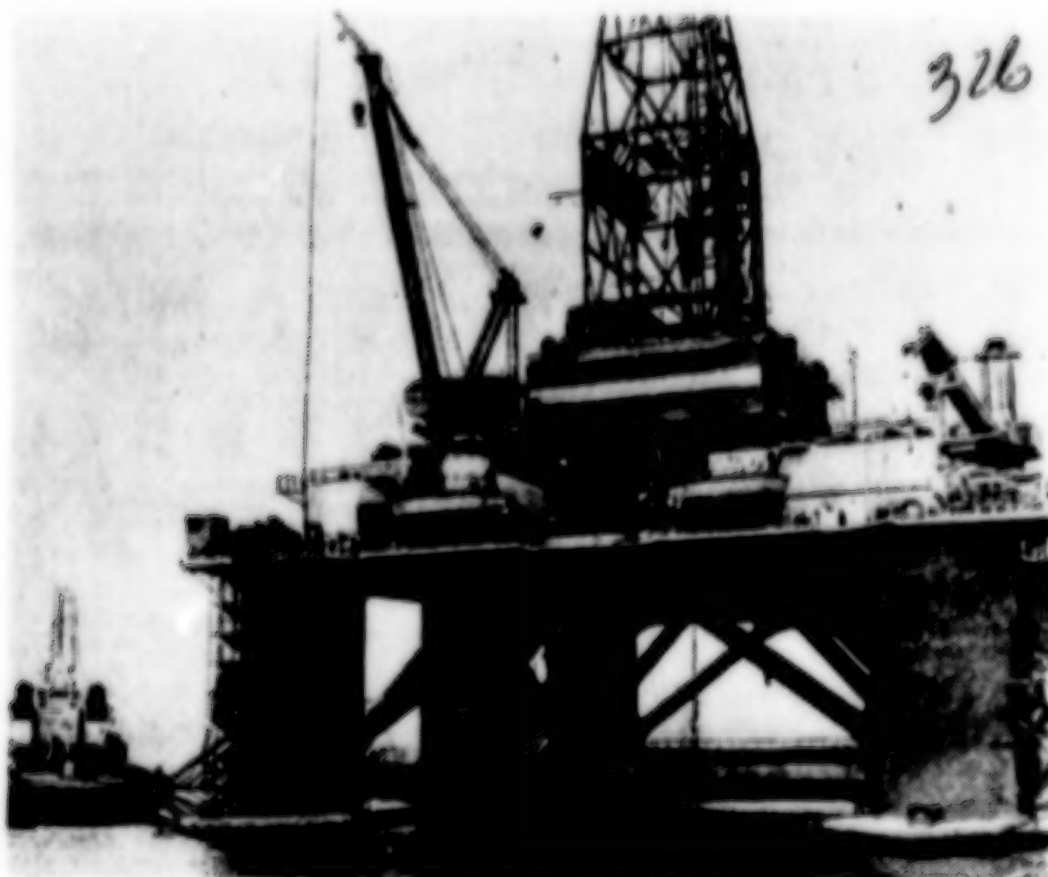
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FUELS

FLOATING DRILL RIG TESTED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Jun 81 p 2

[Text]



Drill Rig "Shel'f-1"

The whole Soviet people is greeting Victory Day with glorious labor performances. Honoring war veterans and paying deep tribute to the memory of those who fell, enterprises and construction-project collectives are striving with their labor to strengthen still more the socialist motherland's might, standing guard for peace on earth.

Caspian oilfield workers also did shockwork during these preholiday days. Right now they are putting the floating drill rig "Shel'f-1" through tests. Mounted on two pontoons, it has impressive dimensions--90 meters long, 64 meters wide and reaching a hundred meters in height. The rig is equipped with a platform for helicopter landings. At the disposal of the drillers are comfortable cabins, a dining room, a wardroom, showers and premises.

The new specially built rig enables holes to be drilled to a depth of 6,000 meters in water depths of as much as 200 meters.

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